Claim

What is claimed is:

1. A semiconductor package with a heat sink, comprising:

a substrate having a top surface and a bottom surface;

at least one chip mounted on the top surface of the substrate and electrically connected to the substrate;

the heat sink mounted on the top surface of the substrate for covering the chip, the heat sink having a flat portion and a support portion connected to the flat portion, wherein the support portion has at least one recess portion facing toward the top surface of the substrate, and at least one burr is formed on an interior surface of the recess portion;

an adhesive material applied between the support portion of the heat sink and the top surface of the substrate to substantially fill the recess portion and submerge the burr, so as to attach the heat sink to the substrate by means of the adhesive material; and

a plurality of solder balls implanted on the bottom surface of the substrate.

2. The semiconductor package as recited in claim 1, wherein the recess portion forms a groove.
3. The semiconductor package as recited in claim 1, wherein the recess portion forms a blind cavity.
4. The semiconductor package as recited in claim 1, wherein the burr is a protruding flange.
5. The semiconductor package as recited in claim 1, wherein the burr is a binary protrusion.
6. The semiconductor package as recited in claim 1, wherein the burr is an elongated protrusion.
7. The semiconductor package as recited in claim 1, wherein at least one of the burr is respectively formed on two opposite interior surfaces of the recess portion.
8. The semiconductor package as recited in claim 1, wherein the burr extends toward the top

surface of the substrate.

9. The semiconductor package as recited in claim 1, wherein the recess portion has quadrate cross-section.

10. The semiconductor package as recited in claim 1, wherein the recess portion has V-shaped cross-section.

11. The semiconductor package as recited in claim 1, wherein the recess portion has semicircular cross-section.

12. The semiconductor package as recited in claim 1, further comprising: a thermally conductive adhesive applied between the chip and the flat portion of the heat sink.

13. The semiconductor package as recited in claim 1, which is a FCBGA (flip-chip ball grid array) package.

14. A semiconductor package with a heat sink, comprising:

a substrate having a top surface and a bottom surface;

at least one chip mounted on the top surface of the substrate and electrically connected to the substrate;

the heat sink mounted on the top surface of the substrate for covering the chip, the heat sink having a flat portion and a support portion connected to the flat portion, wherein the support portion has a contact surface in contact with the top surface of the substrate, and at least one burr is formed on a surface of the support portion other than the contact surface;

an adhesive material applied between the support portion of the heat sink and the top surface of the substrate and submerging the burr to attach the heat sink to the substrate; and

a plurality of solder balls implanted on the bottom surface of the substrate.

15. The semiconductor package as recited in claim 14, wherein the burr is a protruding flange.

16. The semiconductor package as recited in claim 14, wherein the burr is a binary protrusion.

17. The semiconductor package as recited in claim 14, wherein the burr is an elongated protrusion.

18. The semiconductor package as recited in claim 14, wherein the surface with the burr is an inner surface of the support portion that faces toward the chip.

19. The semiconductor package as recited in claim 14, wherein the burr extends toward the top surface of the substrate.

20. The semiconductor package as recited in claim 14, further comprising: a thermally conductive adhesive applied between the chip and the flat portion of the heat sink.